7.3 Quality Assurance Program

Safety Criterion: 7.3 - 1

The following quality assurance elements shall be applied using a graded approach:

(1) Quality Assurance Program

(2) Personnel Training and Qualification,

(3) Quality Improvement,

(4) Documents and Records,

(5) Work Processes,

(6) Design,

(7) Procurement,

(8) Inspection and Acceptance Testing,

(9) Management Assessment, and

(10) Independent Assessment.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 1.3.11 Quality Levels~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (b)(1)
DOE/RL-96-0006 4.1.6.1 Quality Assurance-Quality Assurance Application
DOE/RL-96-0006 4.1.6.2 Quality Assurance-Established Techniques and Procedures

Safety Criterion: 7.3 - 2

A written Quality Assurance Program (QAP) shall be developed, implemented, and maintained. The QAP shall describe the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the work. The QAP shall describe management processes, including planning, scheduling, and resource considerations.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 1.3.9 Quality Assurance Program~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Sections I, II, III, and IV.1, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (a)(1)
10 CFR 830.120 Quality assurance requirements Location: (c)(1)(i)
DOE/RL-96-0006 4.1.1.6 Defense in Depth-Human Aspects
DOE/RL-96-0006 4.1.4.1 Safety/Quality Culture-Safety/Quality Culture
WAC 246-247 Radiation Protection - Air Emissions Location: Part 075 (6)

Safety Criterion: 7.3 - 3

Personnel shall be trained and qualified to ensure they are capable of performing their assigned work. Personnel shall be provided continuing training to ensure that job proficiency is maintained.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 3.15 Training and Qualification~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.2, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(1)(ii)

Safety Criterion: 7.3 - 4

Documents shall be prepared, reviewed, approved, issued, used, and revised to prescribe processes, specify requirements, or establish design. Records shall be specified, prepared, reviewed, approved, and maintained.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Chapter: 8.0 Document Control and Maintenance~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.4, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(1)(iv)

Safety Criterion: 7.3 - 5

Work shall be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means. Items shall be identified and controlled to ensure their proper use. Items shall be maintained to prevent their damage, loss, or deterioration. Equipment used for process monitoring or data collection shall be calibrated and maintained.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 1.3.11 Quality Levels~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.5, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(2)(i)
DOE/RL-96-0006 4.1.6.3 Quality Assurance-Established Techniques and Procedures

---

Safety Criterion: 7.3 - 6

Processes to detect and prevent quality problems shall be established and implemented. Items, services, and processes that do not meet established requirements shall be identified, controlled, and corrected. Correction shall include identifying the causes of problems and preventing recurrence. Item characteristics, process implementation, and other quality-related information shall be reviewed and the data analyzed to identify items, services, and processes needing improvement.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 2.2 Compliance with 10 CFR 830.120, "Quality Assurance Requirements"~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.3, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(1)(iii)
DOE/RL-96-0006 4.1.4.1 Safety/Quality Culture-Safety/Quality Culture

Safety Criterion: 7.3 - 7

Inspection and testing of specified items, services, and processes shall be conducted using established acceptance and performance criteria. Equipment used for inspections and tests shall be calibrated and maintained.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 1.3.11 Quality Levels~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.8, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(2)(iv)
29 CFR 1910 Occupational Safety and Health Standards Location: 119 (j) (6)

Safety Criterion: 7.3 - 8

Managers shall assess their management processes. Problems that hinder the organization from achieving its objectives shall be identified and corrected.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Chapter: 10.0 Assessments~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.9, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(3)(i)

Safety Criterion: 7.3 - 9

Independent assessment shall be planned and conducted to measure item and service quality, to measure the adequacy of work performance, and to promote improvement. The group performing independent assessments shall have sufficient authority and freedom from the line to carry out its responsibilities. Persons conducting independent assessments shall be technically qualified and knowledgeable in the areas assessed.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Chapter: 10.0 Assessments~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.10, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(3)(ii)

Safety Criterion: 7.3 - 10

Compliance audits shall be performed at least every three years to verify that the procedures and practices developed to ensure nuclear and process safety are adequate and are being followed. The compliance audit shall be conducted by at least one person knowledgeable in the process. A report of the findings of the audit shall be developed. An appropriate response shall be determined and documented for each of the findings of the compliance audit, and it shall be documented when deficiencies have been corrected. Employers shall retain the two most recent compliance audit reports.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 5.4 Compliance Audits~~
~~Chapter: 8.0 Document Control and Maintenance~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Sections IV.4 and IV.10, as tailored

Regulatory Basis:

29 CFR 1910 Occupational Safety and Health Standards Location: 119 (o)
40 CFR 68 Chemical Accident Prevention Provisions Location: 58
DOE/RL-96-0006 5.2.12 Compliance Audits

Safety Criterion: 7.3 - 11

Procured items and services shall meet established requirements and perform as specified. Prospective suppliers shall be evaluated and selected on the basis of specified criteria. Processes to ensure that approved suppliers continue to provide acceptable items and services shall be established and implemented.

Implementing Codes and Standards:

~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 2.2 Compliance with 10 CFR 830.120, "Quality Assurance Requirements"~~
DOE G-830.120, Rev. 0, "Implementation Guide for use with 10 CFR Part 830.120, Quality Assurance", April 15, 1994
Section IV.7, as tailored

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (c)(2)(iii)
29 CFR 1910 Occupational Safety and Health Standards Location: 119 (j) (6)

Safety Criterion: 7.3 - 12

Changes made to the Quality Assurance Program (QAP) shall be submitted annually to the regulator for review. The submittal shall identify the changes, the pages affected, the reason for the changes, and the basis for concluding that the revised QAP continues to satisfy the requirements of this section.

~~**Implementing Codes and Standards:**~~
~~BNFL-5193-ISP-01 TWRS-P Project Integrated Safety Management Plan~~
~~Section: 3.3.3 Changes to Safety Documentation~~

Regulatory Basis:

10 CFR 830.120 Quality assurance requirements Location: (b)(3)

Implementation Guide recommends that the following human factor elements be considered: equipment labeling, workplace environment (temperature and humidity, lighting, noise, vibration, and aesthetics), human dimensions, operating panels and controls, component arrangement, warning and annunciator systems, and communication systems (Ref. 5.3).

A

The TWRS-P design engineers, in consultation with operators, will apply these HFE elements in the design of important to safety SSCs to ensure that operational preferences are implemented. Human factors engineering specialists will provide support in the application of HFE.

B

Human factors engineering shall be conducted in accordance with IEEE Std 1023-1988 (Ref. 5.12), as discussed below. Selection of this subordinate standard comports with the nonreactor safety Implementation Guide (Ref. 5.3).

IEEE Std 1023-1988 was developed specifically for nuclear power generating stations. Therefore, this subordinate standard will be tailored to the work and hazards of the TWRS-P facility as follows. The formal HFE process described in subsection 6.1.1 of IEEE Std 1023-1988 will be applied to the evaluation of hazards whose consequences fall into the two highest severity levels – SL-1 and SL-2, with the following clarification:

> BNFL does not plan on constructing a separate plant simulator or physical mockup. The TWRS-P distributed control system (DCS) – including the main control room panels -- is a programmable computer system. BNFL envisions having the DCS built, delivered to the site and proof-tested with the aid of the facility operators well in advance of plant startup. Therefore, a dynamic simulation capability for personnel training will be provided for SSCs with significant human interfaces that involve complex and interactive processes (Ref. IEEE Std 1023-1988 §§ 6.1.1.12 and 6.1.1.18).

Although the structured HFE program outlined in subsection 6.1.1 of IEEE Std 1023-1988 will not be implemented for SL-3 and SL-4 events, the general HFE elements will be considered for all ITS SSCs, as committed above.

Similarly, formal consideration of the HFE techniques and methodologies recommended in Section 5 of IEEE Std 1023-1988 will be undertaken for hazards of severity levels SL-1 and SL-2. Certain of these techniques and methodologies may be utilized in the evaluation of SL-3 and SL-4 events in the context of the normal design and hazard assessment and control effort, as part of the integrated safety management process.

Quality Assurance Program

The TWRS-P Safety Requirements Document (BNFL-5193-SRD-01) Safety Criteria 1.0-10 and Section 7.3 require BNFL to establish and implement a Quality Assurance Program compliant with 10 CFR 830.120. This program is being implemented in accordance with the ~~TWRS-~~ RPP-WTP Quality Assurance Program and Implementation Plan (BNFL-5193-QAP-01~~, Rev. 4~~).

CONTENTS
C

Section Implementing Standard **Page**

4.0 DOE G-830.120, Rev. 0, "Implementation Guide for Use with 10 CFR Part 830.120, Quality Assurance"

Revision: April 15, 1994

Sponsoring Organization: U.S. Department of Energy, Division of Nuclear Safety Policy, Office of Nuclear Policy and Standards (EH-62)

RPP-WTP Specific Tailoring

The following tailoring of DOE G-830.120, Rev. 0 is required for use by BNFL as an Implementing Standard for quality assurance.

Section IV, "Guidelines", is comprised of 10 subsections, each of which contains a subsection entitled "Applicable Standards" (subsections IV.1.4 on p. 3, IV.2.7 on pp. 6-7, IV.3.3 on p. 10, IV.4.4 on p. 13, IV.5.5 on p. 16, IV.6.7 on p. 20, IV.7.8 on pp. 23-24, IV.8.4 on pp. 26-27, IV.9.5 on p. 29, and IV.10.5 on p. 31). By invoking DOE G-830.120, Rev. 0 as an Implementing Standard for quality assurance, BNFL Inc. does not thereby invoke the documents listed in the "Applicable Standards" subsections.

Justification: This tailoring reflects the obvious intent of DOE G-830.12, Rev. 00. For example, subsection IV.1.4 of DOE G-830.120, Rev. 0 states, in part:

> "The following consensus standards provide acceptable methods for implementing many of the requirements of 10 CFR Part 830.120. The principles, recommended approaches, and applications contained in these standards may be used in conjunction with 10 CFR Part 830.120 to develop an effective management system to achieve quality."

In some cases, BNFL Inc. has invoked documents listed in the "Applicable Standards subsections of DOE G-830.120, Rev. 0; however, these cases are specifically listed as implementing standards in the SRD.

Page 1, Section I, Introduction

The last two sentences of this section state:

> "The successful application of the management system should embrace the philosophy described in DOE/HR-0066, Total Quality Management Implementation Guidelines. The principles described in DOE/HR-0066 are applied in practice through the application of the criteria of 10 CFR Part 830.120."

By invoking DOE G-830.120, Rev. 0 as an implementing standard, BNFL Inc. adopts the principles described in DOE/HR-0066 only to the extent that they are specifically embedded within 10 CFR Part 830.120.

Justification: This is the clear intent of the quote above.

Page 12, Section IV.4.3, Records

The 4th paragraph, 3rd through 6th sentences is tailored to read as follows:

> "All records management systems should have schedules for records retention and disposition in accordance with project requirements. Records management systems should address the requirements of the Deactivation Plan. Applicable standards may differ in records management terminology from the NARA requirements. Care should be taken to ensure that the contractual project requirements, applicable standards, and any additional statutory requirements are met."

Justification: This change is needed to ensure that contractual requirements related to records management are met. *TWRS Privatization Contract* No. DE-AC06-96RL13308 – Mod. No. A012, Part I, Section C, Standard 8, "Facility Deactivation", paragraph a.4), "Facility Turnover", states:

> > "The Deactivation Plan shall describe the methods to verify achievement of end-point criteria, protocols for formal turnover of the facility and site to DOE, and the transfer of facility operating records and other documentation."

> The draft *Deactivation Plan*, which will be submitted in support of the Construction Authorization Request, will contain the protocols for transfer of records to DOE during phase 5 of deactivation. These protocols will be updated in the final *Deactivation Plan* that will be submitted with the Production Operations Authorization Request.

Page 18, Section IV.6.1, [Design] Introduction

Replace the second paragraph, second sentence of this section to read:

> "Classification of systems, structures, and components (SSCs) is performed as a result of integrated safety management, as described in Appendix A of the Safety Requirements Document (BNFL-5193-SRD-01)."

Justification: BNFL Inc. does not follow DOE 6430.1 (latest issue) in the classification of SSCs. Instead, BNFL Inc. follows the process outlined in DOE/RL-96-0004, as implemented in Appendix A of the SRD. This approach ensures that classification of SSCs is an output of the integrated safety management steps of process initiation, identification of work, hazard evaluation, and development of control strategies.

Page 19, Section IV.6.5, Design Verification

The third paragraph, first sentence states:

> "Design verification should be completed before design output is used … to support other work such as procurement, manufacture, construction, or experiment."

The term "experiment" in this sentence is interpreted not to refer to BNFL Inc.'s research and technology efforts whose results will ultimately serve as input to the facility design.

Justification: In context, this sentence refers to those experiments that rely on a design output; for example, adjustments to waste processing to improve glass product after the facility is operational. Design verification might be required prior to conducting such an adjustment to ensure that the adjustment would not involve an unreviewed safety question such as introduction of a new hazard. BNFL Inc.'s research and technology program (which might be considered experimental) will provide inputs to the design process.